

Ferns of Kedarnath, Madhyamaheshwar and Tungnath¹

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(With a map)

The paper describes the Fern flora of Madhyamaheshwar and Tungnath hills, regions hitherto not botanically surveyed. This is the first record of Ferns from these areas. The paper also includes the Ferns of Mandakini valley and a survey of ecological distribution of Ferns in the altitudinal range of 1200-4200 m.

INTRODUCTION

Fern flora of Western Himalayas has been studied by a number of botanists through many botanical excursions during the past one hundred years (Clarke 1880; Blanford 1888; Beddome 1892; Hope 1899-1904; Mehra 1939; Stewart 1942, 1945; Rau 1961; and Bir 1963). However, Madhyamaheshwar and Tungnath hills have not been botanised yet and there is no record of Fern flora of these areas. Though a few ferns have been reported from Kedarnath (Rau 1961), there is no comprehensive information about ferns of Mandakini valley. During August-September 1974 and September-October 1975, I led two joint botanical expeditions comprising a team of research workers from four C.S.I.R. laboratories namely R. R. L. Jammu, R. R. L. Jorhat, CIMPO and National Botanic Gardens, Lucknow to the above localities and made an extensive collection of ferns and plants of other groups. The present communication deals with the ferns of these localities and their ecology, distribution and altitudinal range.

During the first expedition, collection was made from Mandakini valley starting from Guptakashi to Kedarnath *via* Sonprayag, Gaurikund and Garunchatti. At Kedarnath a general survey was made upto an altitude of

4250 m. After covering this valley, the collection was made from Madhyamaheshwar region. During the second expedition, in addition to the resurvey of Madhyamaheshwar valley, a survey was also made from Budha Madhyamaheshwar which is about one kilometre away from Madhyamaheshwar and situated at an altitude of 3500 m. In the second phase of this expedition, the Tungnath hills and adjoining areas were covered.

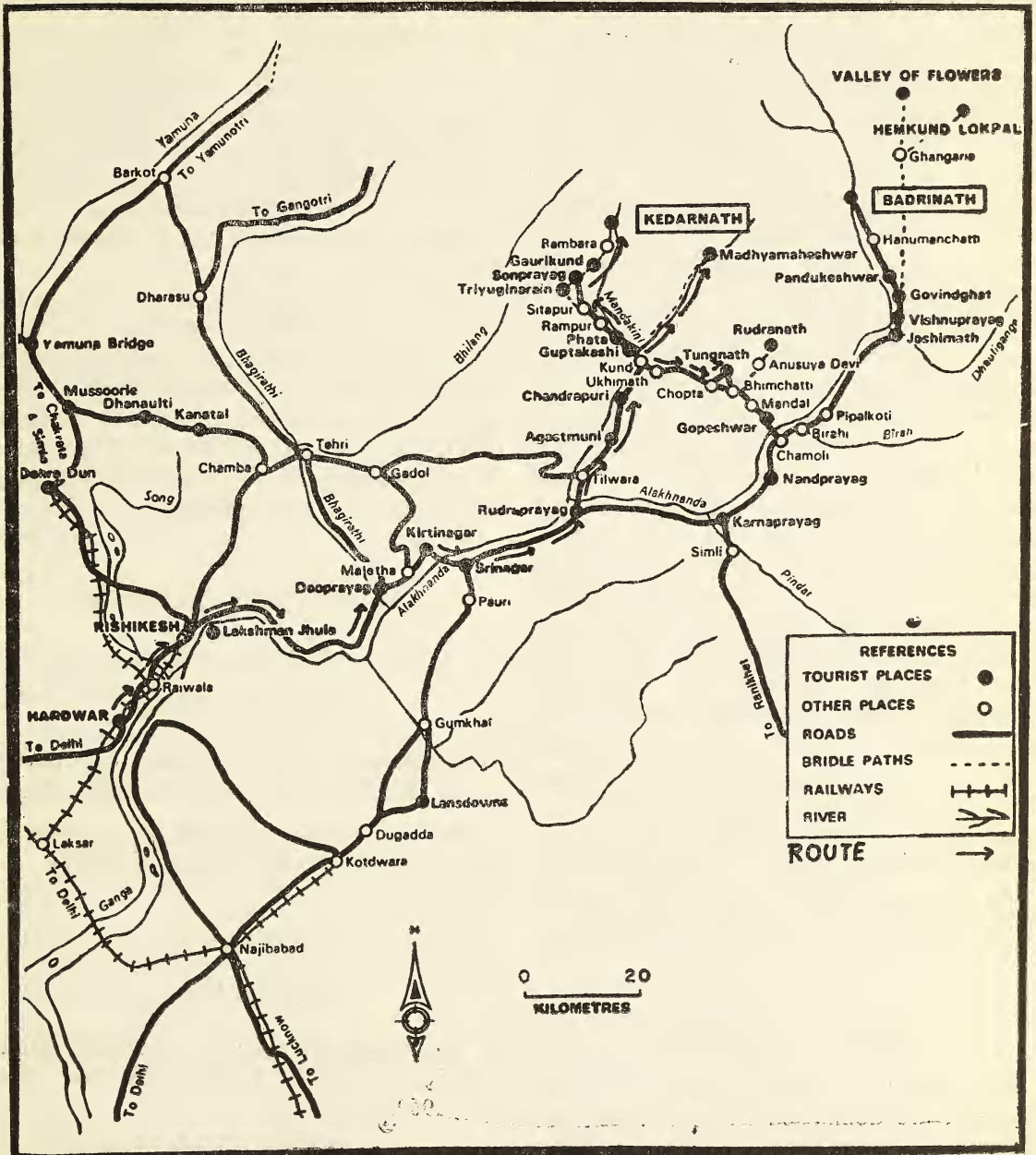
PHYSIOGRAPHY

Madhyamaheshwar is an alpine meadow situated at an altitude of 3100 m, surrounded by lofty snow clad mountains on three sides. About 35 Km long, the green and fertile valley extending from Guptakashi to Gaundar is situated between Mandakini valley on the one hand and the valley of flowers on the other. The route for Madhyamaheshwar bifurcates from Nalachatti, a village about 4 Km beyond Guptakashi on Kedarnath route and passes through Kalimath, Raolank, Ransi and Gaundar. The 9 Km climb, starting from Gaundar the last village *en route*, is very steep and exhausting and the non-availability of drinking water throughout the route up to Madhyamaheshwar, makes the climb more difficult and tiresome. However, for the encouragement of exhausted and discouraged visitors, a board about midway reads 'Do not get disappointed

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Map of the collection area

by the exhausting climb as a panorama abounding in natural beauty awaits you at Madhyamaheshwar'. At Madhyamaheshwar, there is a majestic old temple of Lord Shiva to which is attached the same religious importance as that of Kedarnath but due to difficult terrain and lack of facilities *en route*, hardly 200 to 250 pilgrims visit this shrine in a year. Tillman, the famous mountaineer in his book THE ASCENT OF NANDA DEVI has written 'I have in mind which is not often accomplished to visit Madhyamaheshwar which lies up a valley that few plains men would care to penetrate'.

Like Kedarnath and Madhyamaheshwar, Tungnath is one of the 'Panch Kedars' and attaches much religious importance. There is an all weather metalled road which bifurcates from 'Kund' about 4 Km before Guptakashi and passes *via* Ookhimath, Mastura, Duggalbitta and Chopta, from where Tungnath is hardly two and half kilometres away. However, due to irregular and uncertain Bus service on this route, the entire distance of 45 Km from Ookhimath to Tungnath was covered on foot. Tungnath is situated at an altitude of 3400 m and there is an old temple of Lord Shiva which is architecturally more or less similar to that of Madhyamaheshwar temple. About one kilometre away from Tungnath is a place called 'Chandra Shila' which is the highest point (3750 m) on Tungnath hills. From Chandra Shila one gets an excellent panoramic view of the snows of the Himalayas.

GENERAL VEGETATION

The forests of Madhyamaheshwar and Tungnath are dominated by four species of *Quercus*. At lower altitude (600 m) *Q. glauca* and *Q. incana* were encountered whereas between the range of 600 m-3600 m, *Q. dilata* and *Q. semicarpifolia* were the dominant species. Duggalbitta forest (between 2400-2700 m),

one of the richest encountered *en route* to Tungnath, comprised of *Populus ciliata*, *Acer* species, *Ilex odorata*, *Rhododendron arboreum*, *R. companulatum* and *Buxus sempervirens*, in addition to 3-4 species of Oaks. *Pinus roxburghii* occupied the open grassland on forest slopes along the river and its stream. *Pinus wallichiana* (Blue Pine) was conspicuous by its absence in the Madhyamaheshwar and Tungnath forests, though this is recorded from Kedarnath hills.

All the specimens collected are kept in the herbarium of National Botanic Gardens, Lucknow and the number in brackets (as given in the list) refer to the collection number. The genera here are arranged according to Copeland (1947) system of classification and all the species under each genus are arranged alphabetically with their latest nomenclature.

ENUMERATION OF SPECIES

OPHIOGLOSSACEAE

BOTRYCHIUM Swartz.

B. lanuginosum (Wall. ex Hook. et Grev.) Nishida, Journ. Jap. Bot., 27 : 276, 1952.

Quite common, occurring at Gaurikund, Ransi and Mastura to Pothibasa, (104447).

OSMUNDACEAE

OSMUNDA Linn.

O. claytoniana L., Spec. Pl., 2 : 1066, 1753. Panigrahi et Dixit, J. Indian bot. Soc., 48 : 98, 1969.

Very common, high altitude (upto 3500 m) species, growing densely between Ghanauripani to Kedarnath, Madhyamaheshwar to Budha Madhyamaheshwar and Tungnath to Chandra Shila, (106030).

SCHIZAEACEAE

LYGODIUM Swartz.

L. flexuosum (L.) Sw., Schrad. Journ. Bot. 1800/2 : 106, 1801.

Common at lower altitudes (1200 m). Growing abundantly at Guptakashi, Kalimath, Ookhimath and Mastura, (104936).

PTERIDACEAE

PTERIDIUM Scopoli

P. aquilinum (L.) Kuhn, v. Decken Reise ostaf., 3/3 : 11, 1879.

Very common at exposed, dry places between Guptakashi to Gaurikund, Kalimath to Gaundar and Ookhimath to Duggalbitta, (104442, 106034).

PTERIS Linn.

P. aspericaulis (Wall.) J. G. Agardh, Recens. spec. Gen. Pteridis, 22, 1839.

Sparsely occurring in the forests of Guptakashi, Gaurikund, between Raolank to Gaundar and in Duggalbitta forest, (104442, 106034).

P. cretica L., Mantissa Pl. Alt., 130, 1767.

A very common species growing between 1200-2700 m, forming large, dense patches at somewhat exposed places. The species is very distinct in possessing narrow fertile fronds and broad sterile ones, (104422).

P. pellucida Presl., Rel. Halnk., 1 : 55, 1825.

Not common, met in the forest of Gaurikund, between Gaundar to Madhyamaheshwar and in Duggalbitta forest, (104416).

P. quadriaurita Retz., Obs. Bot., 6 : 38, 1791.

Quite common species growing at moist and shady places between 1200-2400 m, (104416).

P. vittata Linn., Spec. Pl., 2 : 1074, 1753 ; Hieron, Hedwigia 54 : 290, 1914.

A very common lower altitude species occurring between 600-1500 m, at Guptakashi, Gaurikund, Kalimath and Ookhimath to Mastura. The plants of this species occur in small patches at comparatively exposed places, (104415).

P. wallichiana J. G. Agardh, Recens. Spec., Gen. Pteridis 69, 1839.

This is a very distinct species having three partite fronds and condensed tuberous rhizome. Commonly occurring in small colonies throughout the Mandakini valley, Madhyamaheshwar valley and on the Tungnath route upto 2400 m, (104421).

CRYPTOGRAMMA R. Br.

C. crispa (L.) R. Br. ex Hook., Gen. Fil., t. 115 B, 1842.

Not common, occurring between 2400-3300 m. Growing in small protected crevices near Garunchatti and Kedarnath, Madhyamaheshwar and between Chopta to Tungnath, (104116).

CHEILANTHES Swartz.

C. albomarginata Clarke, Trans. Linn. Soc. Ser. 2 Bot., 1 : 456, t 52, 1880.

A very common species growing in rock crevices throughout the Mandakini and Madhyamaheshwar valleys and from Ookhimath to Tungnath, (104415).

C. belangeri (Bory) C. Chr., Index Fil., 172, 1905.

Quite a common species growing at extremely shady and moist places between Sonprayag to Gaurikund, Bantoli (foothill of Madhyamaheshwar) to Madhyamaheshwar, (104110, 104440).

C. bullosa Kunze, *Linnaea*, 24 : 274, 1851 ;
Nayar, *Bull. Bot. Gard.* No. 68 : 27, 1962.

Not common, occurring in Gaurikund and Duggalbitta forests, (104493).

C. dubia Hope, in *Journ. Bombay nat. Hist. Soc.* 12 : 528, t 2, 1899.

A rare species occurring between Sonprayag and Gaurikund (2400 m) at extremely moist and shady places, (104472).

C. rufa D. Don., *Prodr. Fl. Nepal.* 16, 1825.

Very common, growing at comparatively shady places in rock crevices. The species is conspicuous by the extremely hairy nature of the fronds.

A. philippense L., *Spec. Pl.* 2 : 1094, 1753 ;
Nayar, *Bull. Natl. Bot. Gdns.* No. 52 : 5, 1961.

This species is very common between Guptakashi to Kalimath and Mastura to Pothibasa, (104408).

A. venustum Bon., *Prodr. Fl. Nepal.* 17, 1825 ;
Nayar, *Bull. Natl. Bot. Gdns.*, No. 52 : 16, 1961.

A very common species growing usually in rock crevices throughout the Mandakini and Madhyamaheshwar valleys, Pothibasa to Chopta upto an altitude of 3100 m, (104484, 106048).

CONIOGRAMME Fee

C. fraxinea (Don) Diels, *Nat. Pflanzen*, 1/4 : 262, 1899.

A very distinct species commonly occurring upto an altitude of 2400 m, growing densely between Ghanauriapani to Garunchatti, from Kalimath to foothill of Madhyamaheshwar and between Mastura to Duggalbitta, (104114).

ADIANTUM L.

A. caudatum L., *Mantissa Pl. Alt.*, 308, 1771 ;
Nayar, *Bull. Natl. Bot. Gdns.* No. 52, 1961.

A very common species growing throughout the valleys at lower altitudes, (104409).

A. capillus-veneris L., *Spec. Pl.*, 2 : 1096, 1753 ;
Nayar, *Bull. Natl. Bot. Gdns.* No. 52 : 25, 1961.

Quite common fern growing at marshy and shady places, sometimes forming extensive patches by the side of streams. Occurring profusely between Sonprayag to Ghanauriapani, Guptakashi to Bantoli and all along the route from Ookhimath to Chopta, (104444).

GYMNOPTERIS Bernhardt

G. vestita (Wall.) Und., *Bull. Torrey Bot. Club*, 29 : 627, 1902.

A rare species occurring between 2400-3300 m, usually growing in exposed rock crevices. This species was met between Gaurikund to Kedarnath, Raolank to Madhyamaheshwar and Duggalbitta to Tungnath, (104439).

ONYCHIUM Kaulfuss.

O. contiguum (Wall.) Hope, *Journ. Bombay nat. Hist. Soc.* 13 : 444, 1901.

Common species, occurring profusely in Gaurikund forest, between Kalimath to Gaundar and Mastura to Chopta, (104476).

O. siliculosum (Desv.) C. Chr., *Index Fil.* 20, 1905 ; 469, 1906.

This is a very common species growing in patches at semiexposed places. Quite common between Guptakashi to Ghanauriapani, Kalimath to Gaundar and Ookhimath to Chopta, (106084).

O. japonicum (Thbg.) Kze., Bot. Zeit., 6 : 507, 1848.

Quite common at Gaurikund, between Gaundar to Bantoli and Pothibasa to Chopta, (104453, 106046).

NOTHOLAENA R. Br.

N. marantae (L.) R. Br., Prodr. Fl. Nov. Holl., 146, 1810, Desv ; Journ. de Bot. appl., 1 : 92, 1813.

A very rare species of fern occurring at Ghanauriapani and Garunchatti ; usually growing between 2100-4500 m. This species was not collected from Madhyamaheshwar valley and Tugnath hills, (104107).

MICROLEPIA Presl.

M. strigosa (Thbg.) Pr., Epim. Bot., 95, 1849 ; Nayar et Kaur, Bull. Natl. Bot. Gdns. No. 79 : 16, 1963.

A very distinct species, forming dense patches at shady and moist places between Sonprayag to Gaurikund, Kalimath to Gaundar and Pothibasa to Duggalbitta, (104464).

DAVALLIACEAE

LEUCOSTEGIA Presl.

L. immersa (Wall.) Pr., Tent Pterid., 95, t 4, f 11, 1836.

A very common epiphyte on tree trunks, growing profusely between Sonprayag to Gaurikund, Kalimath to foothill of Madhyamaheshwar and between Mastura to Duggalbitta, (104473).

L. pulchra J. Sm., London Journ. Bot., 1 : 426, 1842.

The most common epiphyte on tree trunks and wooden logs at Sonprayag, Gaurikund,

Lakarmandi, between Gaundar to Madhyamaheshwar and Pothibasa to Chopta, (104470).

L. delavayi (Bedd. ex Clarke et Bak.) Ching, in C. Chr., Index fil., Suppl. 3 : 120, 1934.

A rare species, growing sparsely on tree trunks between Gaurikund, Ghanauriapani, and at Madhyamaheshwar. This species was not collected from Tugnath area, (104127).

ASPIDIACEAE

POLYSTICHUM Roth.

P. bakerianum (Atkins.) Diels, Nat. Pflanzen., 14 : 191, 1899.

A high altitude species occurring at 3000 m, very common at Kedarnath and Madhyamaheshwar, (104113).

P. discretum (Don) Diels, Nat. Pflanzen, 1/4, 199, 1899.

Not common, a very distinct species characterised by densely hairy nature of the fronds. Occurring in Duggalbitta forest on Duggalbitta-Pothibasa short cut route, (106056).

P. lentum (D. Don) Moore, Index Fil., 86, 1858.

A very common species growing at somewhat exposed places throughout the valleys upto 2400 m, (104429).

P. nepalense (Sprengel) C. Chr., Index Fil., 84, 1905.

A large species, growing between 2400 to 3000 m at comparatively shady places. Quite common at Duggalbitta on Duggalbitta-Pothibasa short cut route, (106079).

P. nepalense var. *subbipinnatum* C. Chr. in Contr. U.S. Nat. Herb. 20 : 284, 1931.

Not a common fern, growing on Pothibasa-Duggalbitta short cut route, (106050). Not collected from other localities.

P. neolobatum Nakai, Fl. Himal. 480, 1966.

Not a common species, occurring at moist and shady places at Madhyamaheshwar, (106078).

P. prescottianum (Wall. ex Mett.) Moore, Index Fil., 101, 1858.

Very common at high altitude (between 2400-3600 m), growing profusely at Gaurikund, Kedarnath, Madhyamaheshwar, and Tungnath hills, (104117).

P. setiferum (Forsk.) Moore ex Woynar, Mitt. Naturw. ver. Steiermark, 49 : 181, 1913.

Common fern, growing between Gaurikund to Kedarnath, Kalimath to Madhyamaheshwar and Mastura to Chopta, (104102).

P. squarrosum (D. Don) Fee, Gen. Fil., 278, 1852.

A very common fern occurring throughout both the valleys and Ookhimath to Chopta, (104443, 106049).

P. stimulans Pr., Tent. Pterid., 83, 1836.

Quite common fern growing at shady places in rock crevices between Gaurikund to Kedarnath, Ransi to Madhyamaheshwar and Duggalbitta to Chopta, (104478).

P. thomsoni (Hook. f) Bedd., Ferns Brit. India, 1 : 5 126, 1866.

A rare species occurring at extremely shady, humid and marshy places in rock crevices between 2100-3000 m. This species was collected between Gaurikund to Rambara and at Chopta, (104104).

HYPODEMATIUM Kunze

H. crenatum (Forsk.) Kuhn, v. Decken Reise Ostaf., 3/3 : 37, 1879.

A common ornamental species growing at lower altitudes throughout the Mandakini valley, Madhyamaheshwar valley and Ookhimath to Duggalbitta, (104404).

THELYPTERIS Schmidel

T. auriculata (J. Sm.) K. Iwat., Acta. Phytotax. Geobot. 19 : 11, 1961.

Quite common at Guptakashi, Gaurikund, Ransi to Gaundar and Mastura to Pothibasa, (104466).

T. ochthodes (Kunze) Ching, Bull. Fan. Mem. Inst., Biol. Bot., 6 : 300, 1936.

A tall distinct species, quite common between Guptakashi, to Sonprayag, Kalimath to Gaundar and Mastura to Duggalbitta, (104411).

T. repens (Hope) Ching in Bull. Fan. Mem. Inst. Biol. 6 : 304, 1936.

A very common species growing at shady and moist places between 1200-1500 m, (104449).

GLAPHYROPTERIDOPSIS Ching

G. erubescens (Wall. ex Hook.) Ching, Acta. Phytotax. Sin. 8 : 319, 320, 1963.

Very common in shady and moist clefts at Gaurikund, Raolank to Gaundar and Mastura to Duggalbitta. It is a tall growing species characterised by the presence of distinct aerophore at each base of costae underneath and naked sori, (104459).

PSEUDOPHEGOPTERIS Ching

P. levingei (Clarke) Ching, Acta. Phytotax. Sinica 8 : 314, 1963.

A tall, exindusiate species, growing at extremely shady and moist places at Gaurikund, foothill of Madhyamaheshwar and between Pothibasa to Duggalbitta, (106080).

DRYOPTERIS Adanson

D. barbiger (Hook.) O. Ktze., Rev. Gen. Pl., 2 : 812, 1891.

Quite common at Guptakashi, Sonprayag to Gaurikund, Kalimath to Gaundar and Mastura to Duggalbitta, (106081).

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D. cochleata (Don) V. Chr., Index Fil., 258, 1905.

Quite common growing at dry and exposed places between Guptakashi to Sonprayag, Kalimath to foothill of Madhyamaheshwar and Mastura to Pothibasa, (104445).

D. deparioides O. Ktze., Rev. Gen. Pl., 2 : 812, 1891.

Not common, occurring sparsely at Gaurikund and Raolank to Gaundar, (104461).

ATHYRIUM Roth.

A. duthiei (Bedd.) Bedd., Handb. Suppl, 34, 1892.

Quite common species occurring at shady and moist places throughout the valleys between 1500-2000 m, (104413).

A. pectinatum (Wall.) Pr., Tent Pterid. 98, 1836.

A rather low altitude fern, growing commonly between 600-1300 m. Quite common at Guptakashi, Kalimath to Raolank and Ookhimath to Pothibasa, (106082).

DIPLAZIUM Swartz.

D. bellum (Clarke) Bir., J. Indian bot. Soc. 43 : 571, 1964.

Not a common species, collected from Gaurikund, Bantoli, and Pothibasa to Duggalbitta, (106083).

D. esculentum (Retz.) Sw. ex Schrad. in Journ. Bot. 1, 1801/2 : 312, 1803.

This is one of the commonest species throughout the valleys and Ookhimath to Chopta, (104424).

D. polypodioides Bl., Enum. Pl. Jav., 194, 1828.

Not common, growing sparsely between Gaurikund to Garunchatti, 5000 m, (104475).

WOODSIA R. Br.

W. alpina (Dalton) Gray, Nat. arr. br. pl., 2 : 17, 1821.

Very common, growing in moist and shady places between Guptakashi to Rambara, Gaundar to Madhyamaheshwar and Pothibasa to Chopta, (104427).

CYSTOPTERIS Benth.

C. fragilis (L.) Bernh., Schard. Neu. Journ. 1/2 : 26, 52, f 9, 1806.

Quite common fern, growing in shady places from Sonprayag to Ghanauriapani, throughout the Madhyamaheshwar valley and Pothibasa to Chopta, (104413).

TECTARIA Cav.

T. cicutaria (L.) Copel., Philip. Jour. Sci., 2C : 410, 1907.

A very common species at Guptakashi, Kalimath and Ookhimath, (104417).

LEPTOGRAMMA J. Sm.

L. totta (Schlecht.) J. Sm., Hook. Journ. Bot., 4 : 52, 1841.

Not common, occurring in Duggalbitta forest in shady and moist places, (106062).

BLECHNACEAE

WOODWARDIA Smith

W. radicans (L.) Smith, Mem. Acad. Turin, 5 : 412, 1793.

Quite common at Gaurikund, Gaundar and between Pothibasa to Duggalbitta, (104438, 106063).

ASPLENIACEAE

ASPLENIUM L.

A. dalhousiae Hook., *Icones Pl.*, t 105, 1837.

A very common species occurring throughout the valley upto 2700 m, (104495).

A. ensiforme Wall., *Cat. no. 200*, 1828 (nom. nud.); Hook. et Grev., *Icones Fil.*, 1 : t 71, 1829.

Not common, an epiphytic species growing on tree trunks at Gaurikund and Duggalbitta, (104482).

A. exiguum Bedd., *F.S. India*, t 146, 1863.

A rare fern, occurring in damp moist caves between Lakarmandi and Ghanauriapani near Kedarnath, (104126).

A. laciniatum D. Don, *Prodr. Fl. Nepal*, 8, 1825.

Sparsely occurring in the forest of Guptakashi and Raolank and between Pothibasa to Duggalbitta, (104410).

A. trichomanes Linn., *Spec. Pl.*, 2 : 1080, 1753.

A very common species growing at extremely moist and shady places between Gaurikund to Rambara, foothill of Madhyamaheshwar and Duggalbitta to Chopta, (104483).

POLYPODIACEAE

PHYMATODES Presl.

A. stracheyi Ching in *Contr. Inst. Bot. nat. Acad. Peiping* 2 : 83, 1933.

Quite common at Duggalbitta (2400 m) and on the way to Chopta, (106068).

CRYPsinUS Presl.

C. ebenepes (Hook.) Copel.

A very common species growing on moist rocks and in rock crevices at Chopta, 3000 m, (106066).

C. hastatus (Thunb.) Copel. *Gen. Fil.*, 206, 1947.

One of the commonest species at Guptakashi, Gaurikund and Kalimath to Gaundar, (104423).

C. malacodon (Hook.) Copel. *Gen. Fil.*, 206 : 1947.

A high altitude species (upto 3500 m) commonly growing at Kedarnath and Madhyamaheshwar, (104124).

LEPIOSORUS J. Sm.

L. excavatus (Bory) Ching, *Bull. Fan. Mem. Inst. Bot.*, 4 : 68, 1933.

Very common species at Guptakashi, Sonprayag to Rambara, Kalimath to Gaundar and on Tungnath route, (104481).

L. kashyapii (Mehra) Mehra in *Bir. Res. Bull. Punjab Univ. (n.s.)* 13 : 23, 1962.

Quite common epiphyte on tree trunks at Madhyamaheshwar and Chopta (2700-3000 m), (106069).

L. pseudonudus Ching., *Bull. Fan. Mem. Inst. Biol.* 4 : 83, 1933.

Quite common at Duggalbitta and Chopta, (106070).

L. thunbergianus (Kaulf.) Ching, *Bull. Fan. Mem. Inst. Biol., Bot.* 4 : 88, 1933.

One of the commonest epiphyte throughout the valleys, (104402).

L. ussuriensis (Regal and Maack) Ching in *Bull. Fan. Mem. Inst. Biol.* 4 : 91, 1933.

A quite common high altitude (3000 m) epiphyte, growing on logs and tree trunks at Chopta, (106077).

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ARTHROMERIS (Moore) J. Sm.

A. wallichiana (Spr.) Ching, Contr. Inst. Bot. Nat. Acad. Peiping, 2 : 92, 1933.

Very common species at Guptakashi, Kalimath, and Pothibasa to Duggalbitta, (104431, 106047, 106065).

LOXOGRAMMA (Bl.) Presl.

L. involuta (D. Don) Presl., Tent. Pterid., 215, 1836.

Not common, sparsely occurring at Kalimath, Gaurikund and Duggalbitta, (104432).

POLYPODIUM L.

P. amoenum Wall., Cal. no. 290, 1828 (nom. nud.); Mett., *Polypodium*, 80 n. 131, 1857.

A very common epiphyte throughout the valleys, occurring densely at Gaurikund, foothill of Madhyamaheshwar and Mastura to Chopta, (106067).

P. argutum Wall., Cat. no. 308, 1828 (nom. nud.); Hook., Spec. Fil., 5 : 32, 1863.

Common throughout the Mandakini valley upto Ghanauriapani, Kalimath to Gaundar and Mastura to Chopta, (106072).

P. lachnopus Wall., Cat. no. 310, 1828 (nom. nud.), Hook., Icones. Pl., t 952, 1854.

A very common fern at Gaurikund, Gaundar to Madhyamaheshwar and between Duggalbitta to Chopta, 2400-3000 m, (106074).

MICROSORIUM Link

M. membranaceum (D. Don) Ching, Bull. Fan. Mem. Inst. Biol. Bot. 4 : 309, 1933 ; Nayar, Bull. Natl. Bot. Gdns. no. 58 : 17, 1961.

A very common species growing at moist and shady places, forming dense patches throughout

the valley from Rampur to Ghanauriapani, Nalachatti to Gaundar and Pothibasa to Chopta, (104403).

DRYNARIA (Bory) J. Sm.

D. propinqua (Wall. ex Mett.) J. Sm., Hook. Journ. Bot., 4 : 61, 1842 ; Nayar, Bull. Natl. Bot. Gdns., no. 56 : 9, 1961.

One of the commonest epiphyte covering entire trees and logs at Gaurikund, foothill of Madhyamaheshwar, and Duggalbitta to Chopta, (106075).

PLEOPELTIS (H. & B.)

P. macrocarpa (Bory ex Willd.) Klf., Berlin. Jahrb. Pharm., 21 : 41, 1820 ; Pichi. Sermoli, 20 : Webbia, 353, 1965.

Not common, sparsely occurring at Gaurikund, (104481).

PYRROSIA Mirbel.

P. adnascens (Sw.) Ching, Bull. Chin. Bot. Soc., 1 : 45, 1945 ; Nayar et Chandra, Bull. Natl. Bot. Gdns., no. 117 : 48, 1965.

A rare epiphyte in this area. One specimen was collected near Sonprayag on way to Kedarnath, (104120).

VITTARIACEAE

VITTARIA Smith

V. flexuosa Fee, Mem. Fam. Foug., 3 : 16, 1851-52.

Not common, collected only from Chopta on way to Tungnath, 3100 m, (106053). No specimen was collected from Madhyamaheshwar valley.

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